

Soil Performance Standards and Site Closure



Terry Evanson, Hydrogeologist
WDNR, Madison



Definition of Soil

- NR 700.03(58)

“Soil” means **unsaturated** organic material, derived from vegetation and **unsaturated**, loose, incoherent rock material, of any origin, that rests on bedrock other than foundry sand, debris and any industrial waste.



NR 720 & Closure of Contaminated Soil Sites

- Generic Table 1 - NR 720.09 and
Table 2 - NR 720.11
- Site Specific RCLS - NR 720.19(3)
<http://risk.lsd.ornl.gov/epa/ssl1.htm>
- Soil Performance Standards -
NR 720.19(2)



NR 746 Soil Concentrations

- Apply only to petroleum tank sites
- Apply only to direct contact pathway (when used in conjunction w/ NR 720)
- Incorporated into NR 720 through an exception (NR 720.11(5))



Application of NR 746 to Site Investigation

- NR 746.05 requires that NR 716 site investigation requirements be met at petroleum tank sites
- All pathways that present a threat must be addressed, even if soil contaminant levels are below soil screening levels.



Application of NR 746 to Site Investigation

- If all risk & closure criteria in NR 746 met, site is exempt from NR 720 & SPS do not apply.



Common Misunderstanding

- Comparing NR 720 Table 1 - GW protection with NR 746 Table 1 & 2 - DC protection

<u>Cmpd</u>	<u>NR 720.09</u>	<u>NR 746.06</u>
Benzene	5.5 ug/kg	1600 ug/kg
1,2 DCA	4.9 ug/kg	560 ug/kg
Ethylben.	2900 ug/kg	4600 ug/kg



SPS - Definition

- NR 720.19(2), “remedial action is operated and maintained . . . until the lowest concentration that is practicable is achieved **or** a permanent engineering control is maintained, or both, so that the residual contaminants left in the soil do not pose a threat to public health, safety and welfare or the environment.



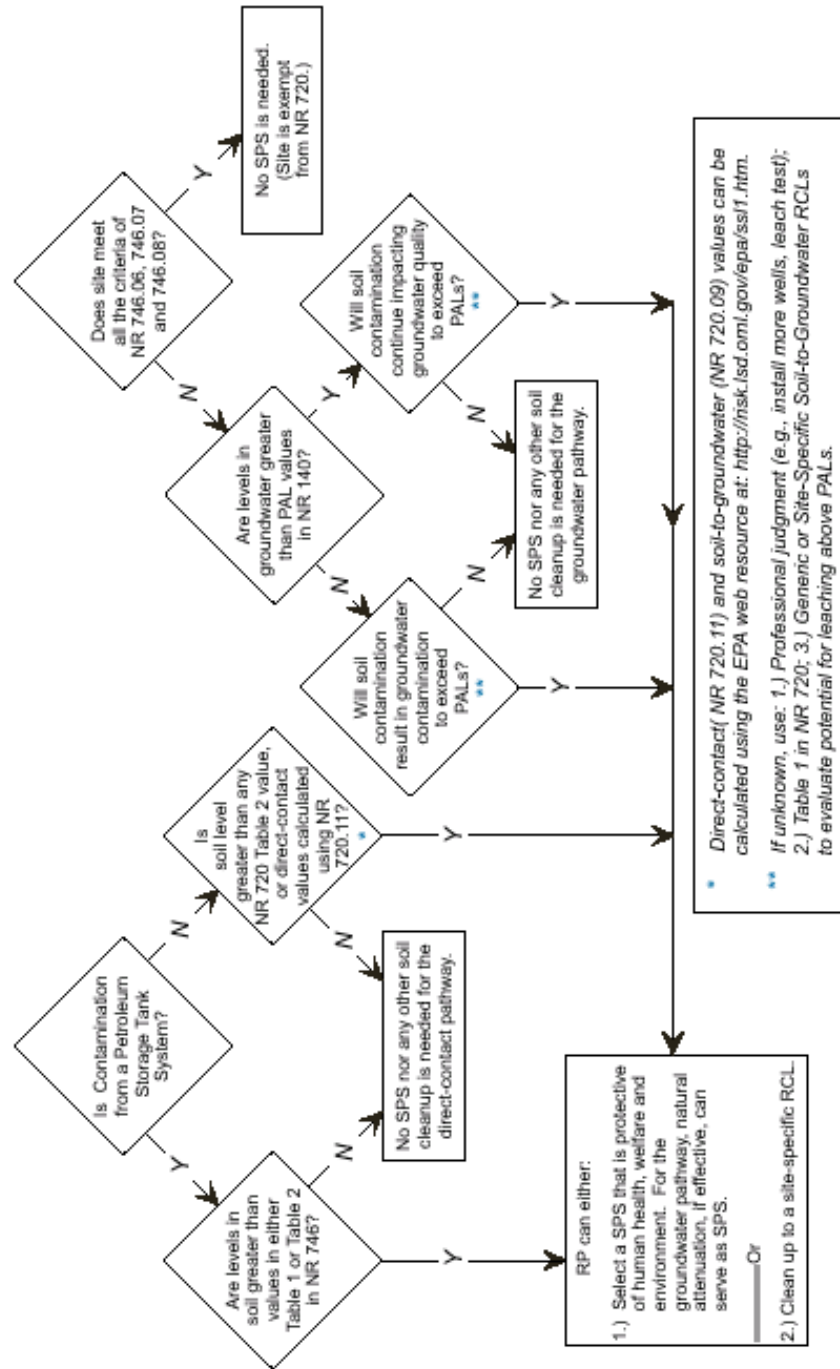
SPS Guidance

- PUBL-RR-528-97, Interim Guidance on Soil Performance Standards
- PUB-RR-676, Application of Soil Performance Standards Guidance

Decision Path for the Application of Soil Performance Standards (SPS)

Direct-Contact Pathway

Groundwater Pathway





What qualifies as a SPS?

- Any remedial action or engineering control that is operated & maintained until identified threat no longer exists.
- Pathway specific -- can apply SPS for direct contact, groundwater pathway runoff protection, vapor migration, etc.



Most Common Types of SPS

- Barriers - specifically surface caps
- Natural attenuation in groundwater



Surface Caps

- Type & design always site specific based on such things as:
 - type of protection needed
 - site accessibility & institutional controls
 - expected life of cap
 - land use
 - likelihood of disturbance
 - frost depth

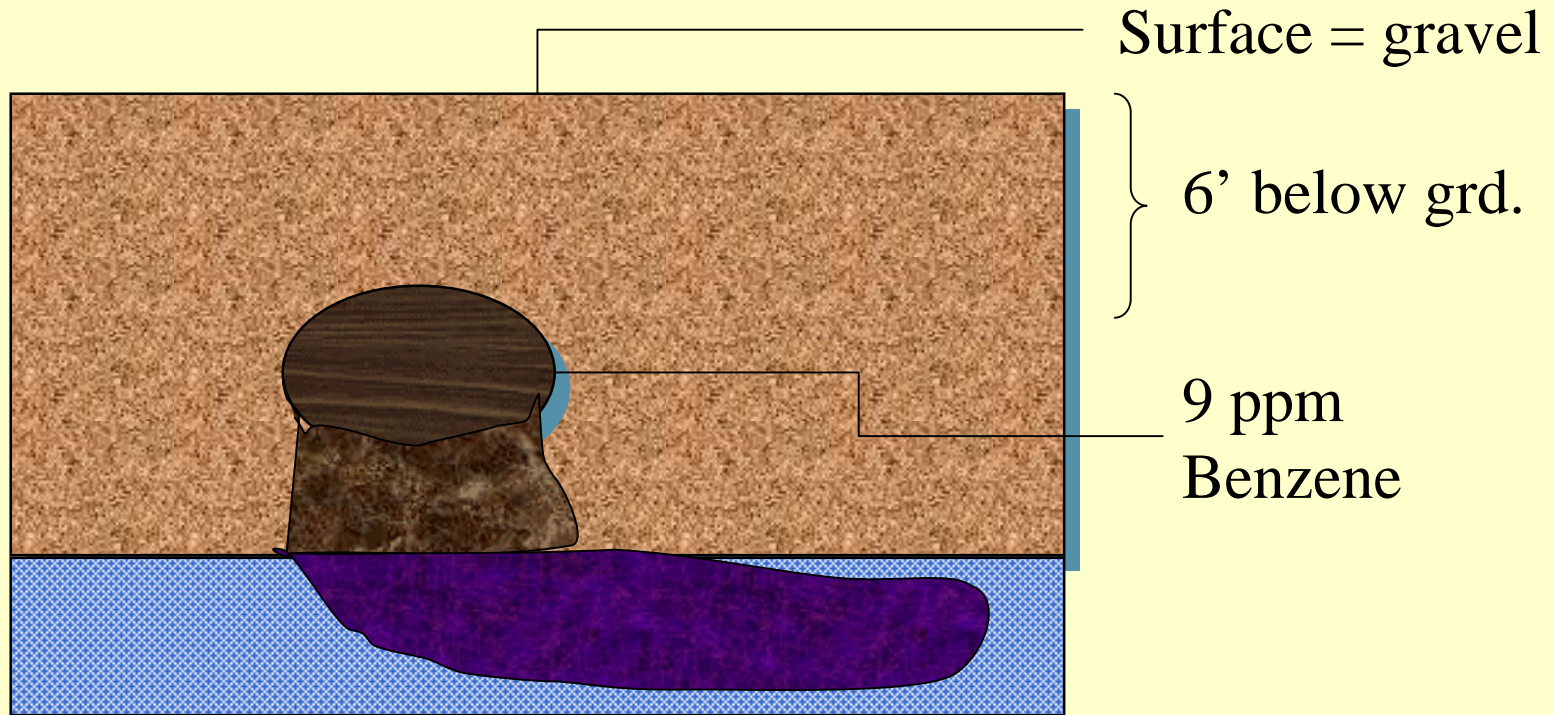


Natural Attenuation in Groundwater

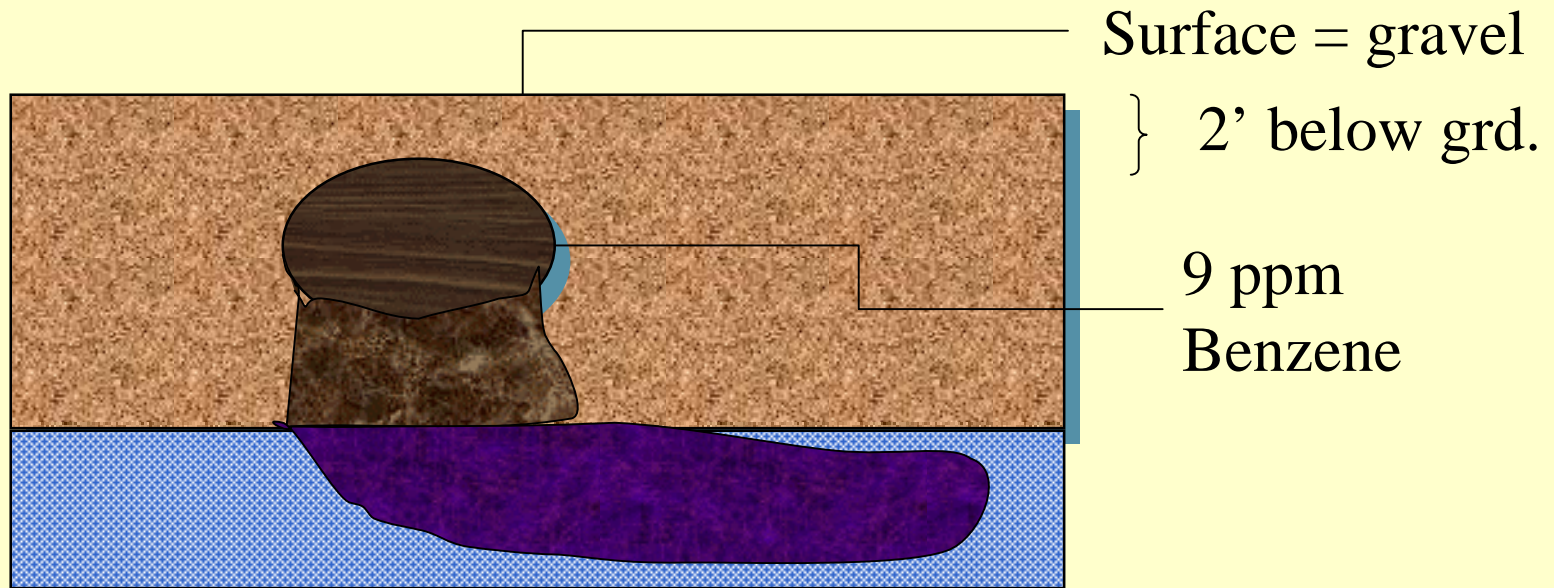
- Natural attenuation must be shown to be effective*.
- Assume that contaminant leaching from soils will not change over time.

★ **Interim Guidance on Natural Attenuation For
Petroleum Releases, PUB-RR-614**

Application of SPS - Example 1



Application of SPS - Example 2





Existing Site Conditions & SPS

- Existing surface seals - such as asphalt - may serve as a SPS.
- Maintenance agreements needed & cap must be maintained after closure.
- Will require a deed restriction on the property.